


# VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS

## PCT

### INTERNATIONALER VORLÄUFIGER PRÜFUNGSBERICHT (Artikel 36 und Regel 70 PCT)

Aktenzeichen des Anmelders oder Anwalts O.Z. 6069-WO	<b>WEITERES VORGEHEN</b> siehe Mitteilung über die Übersendung des internationalen vorläufigen Prüfungsberichts (Formblatt PCT/PEA/416)	
Internationales Aktenzeichen PCT/EP 03/06543	Internationales Anmeldedatum (Tag/Monat/Jahr) 20.06.2003	Prioritätsdatum (Tag/Monat/Jahr) 22.08.2002
Internationale Patentklassifikation (IPK) oder nationale Klassifikation und IPK C08G77/18		
Anmelder DGUSSA AG		
<p>1. Dieser internationale vorläufige Prüfungsbericht wurde von der mit der internationalen vorläufigen Prüfung beauftragten Behörde erstellt und wird dem Anmelder gemäß Artikel 36 übermittelt.</p> <p>2. Dieser BERICHT umfaßt insgesamt 5 Blätter einschließlich dieses Deckblatts.</p> <p><input checked="" type="checkbox"/> Außerdem liegen dem Bericht ANLAGEN bei; dabei handelt es sich um Blätter mit Beschreibungen, Ansprüchen und/oder Zeichnungen, die geändert wurden und diesem Bericht zugrunde liegen, und/oder Blätter mit vor dieser Behörde vorgenommenen Berichtigungen (siehe Regel 70.16 und Abschnitt 607 der Verwaltungsrichtlinien zum PCT).</p> <p>Diese Anlagen umfassen insgesamt 5 Blätter.</p>		
<p>3. Dieser Bericht enthält Angaben zu folgenden Punkten:</p> <ul style="list-style-type: none"><li>I <input checked="" type="checkbox"/> Grundlage des Bescheids</li><li>II <input type="checkbox"/> Priorität</li><li>III <input type="checkbox"/> Keine Erstellung eines Gutachtens über Neuheit, erfinderische Tätigkeit und gewerbliche Anwendbarkeit</li><li>IV <input type="checkbox"/> Mangelnde Einheitlichkeit der Erfindung</li><li>V <input checked="" type="checkbox"/> Begründete Feststellung nach Regel 66.2 a)ii) hinsichtlich der Neuheit, der erfinderischen Tätigkeit und der gewerblichen Anwendbarkeit; Unterlagen und Erklärungen zur Stützung dieser Feststellung</li><li>VI <input type="checkbox"/> Bestimmte angeführte Unterlagen</li><li>VII <input type="checkbox"/> Bestimmte Mängel der internationalen Anmeldung</li><li>VIII <input type="checkbox"/> Bestimmte Bemerkungen zur internationalen Anmeldung</li></ul>		
Datum der Einreichung des Antrags  11.12.2003	Datum der Fertigstellung dieses Berichts  07.01.2005	
Name und Postanschrift der mit der internationalen Prüfung beauftragten Behörde   Europäisches Patentamt D-80298 München Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Bevollmächtigter Bediensteter  Buestrich, R  Tel. +49 89 2399-7473	



**1. Grundlage des Berichts**

1. Hinsichtlich der **Bestandteile** der internationalen Anmeldung (*Ersatzblätter, die dem Anmeldeamt auf eine Aufforderung nach Artikel 14 hin vorgelegt wurden, gelten im Rahmen dieses Berichts als "ursprünglich eingereicht" und sind ihm nicht beigelegt, weil sie keine Änderungen enthalten (Regeln 70.16 und 70.17)*):

**Beschreibung, Seiten**

1-15 in der ursprünglich eingereichten Fassung

**Ansprüche, Nr.**

1-17 eingegangen am 14.10.2004 mit Schreiben vom 12.10.2004

2. Hinsichtlich der **Sprache**: Alle vorstehend genannten Bestandteile standen der Behörde in der Sprache, in der die internationale Anmeldung eingereicht worden ist, zur Verfügung oder wurden in dieser eingereicht, sofern unter diesem Punkt nichts anderes angegeben ist.

Die Bestandteile standen der Behörde in der Sprache: zur Verfügung bzw. wurden in dieser Sprache eingereicht; dabei handelt es sich um:

- ☐ die Sprache der Übersetzung, die für die Zwecke der internationalen Recherche eingereicht worden ist (nach Regel 23.1(b)).
- ☐ die Veröffentlichungssprache der internationalen Anmeldung (nach Regel 48.3(b)).
- ☐ die Sprache der Übersetzung, die für die Zwecke der internationalen vorläufigen Prüfung eingereicht worden ist (nach Regel 55.2 und/oder 55.3).

3. Hinsichtlich der in der internationalen Anmeldung offenbarten **Nucleotid- und/oder Aminosäuresequenz** ist die internationale vorläufige Prüfung auf der Grundlage des Sequenzprotokolls durchgeführt worden, das:

- ☐ in der internationalen Anmeldung in schriftlicher Form enthalten ist.
- ☐ zusammen mit der internationalen Anmeldung in computerlesbarer Form eingereicht worden ist.
- ☐ bei der Behörde nachträglich in schriftlicher Form eingereicht worden ist.
- ☐ bei der Behörde nachträglich in computerlesbarer Form eingereicht worden ist.
- ☐ Die Erklärung, daß das nachträglich eingereichte schriftliche Sequenzprotokoll nicht über den Offenbarungsgehalt der internationalen Anmeldung im Anmeldezeitpunkt hinausgeht, wurde vorgelegt.
- ☐ Die Erklärung, daß die in computerlesbarer Form erfassten Informationen dem schriftlichen Sequenzprotokoll entsprechen, wurde vorgelegt.

4. Aufgrund der Änderungen sind folgende Unterlagen fortgefallen:

- ☐ Beschreibung,           Seiten:
- ☐ Ansprüche,            Nr.:
- ☐ Zeichnungen,        Blatt:

5. ☐ Dieser Bericht ist ohne Berücksichtigung (von einigen) der Änderungen erstellt worden, da diese aus den angegebenen Gründen nach Auffassung der Behörde über den Offenbarungsgehalt in der ursprünglich eingereichten Fassung hinausgehen (Regel 70.2(c)).

(Auf Ersatzblätter, die solche Änderungen enthalten, ist unter Punkt 1 hinzuweisen; sie sind diesem Bericht beizufügen.)

**INTERNATIONALER VORLÄUFIGER  
PRÜFUNGSBERICHT**

Internationales Aktenzeichen **PCT/EP 03/06543**

6. Etwaige zusätzliche Bemerkungen:

**V. Begründete Feststellung nach Artikel 35(2) hinsichtlich der Neuheit, der erfinderischen Tätigkeit und der gewerblichen Anwendbarkeit; Unterlagen und Erklärungen zur Stützung dieser Feststellung**

- |                                |                     |
|--------------------------------|---------------------|
| 1. Feststellung                |                     |
| Neuheit (N)                    | Ja: Ansprüche 1-17  |
|                                | Nein: Ansprüche     |
| Erfinderische Tätigkeit (IS)   | Ja: Ansprüche 1-17  |
|                                | Nein: Ansprüche     |
| Gewerbliche Anwendbarkeit (IA) | Ja: Ansprüche: 1-17 |
|                                | Nein: Ansprüche:    |

2. Unterlagen und Erklärungen:

**siehe Beiblatt**

**Re item V:**

**Reasoned statement with regard to novelty, inventive step and industrial applicability, Article 33(2) to (4) PCT**

- D1: US6395856
- D2: EP0518057 (cited in the application)
- D3: EP0814110 (cited in the application)
- D4: EP0978525 (cited in the application)
- D5: EP1205505 (cited in the application)
- D6: US4526922 (cited in the application)

1. The subject-matter of claims 1-17 of the present application is novel in the sense of Art.33(2) PCT.

D1 discloses a co-oligomeric organosiloxane which, as organofunctional groups, bears vinyl, acrylic or methacrylic groups and at least one group from the series alkyl and phenyl, and at least one alkoxy or hydroxygroup (see D1, col.11 to col.12, l.15). D1 further discloses the use of oligomeric alkoxysiloxanes as low VOC coupling agents (D1, col.6, l.49-61) for elastomer cable insulation (D1, col.19, l.34-40 and col.22, l.1 to col.23, l.30).

The present application differs from D1 in that mixtures of vinyl- or acrylic functional alkoxysiloxanes with alkyl- or phenyl alkoxysiloxanes are disclosed. Therefore the subject-matter of claims 1-17 is novel over D1.

D2 discloses a co-oligomeric organosiloxane which, as organofunctional groups, bear vinyl and alkyl groups (D2, cl.1) as well as the use of oligomeric alkoxysiloxanes as low VOC coupling agents for elastomer cable insulation (D2, example 1 and page 1, l.1-34).

The present application differs from D2 in that mixtures of vinyl- or acrylic functional alkoxysiloxanes with alkyl- or phenyl alkoxysiloxanes are disclosed. Therefore the subject-matter of claims 1-17 is novel over D2.

D3 discloses a co-oligomeric organosiloxane which, as organofunctional groups, bears a methacryl- or acryl group (D3, cl.3) and optionally an alkyl or phenyl group as well as the use of oligomeric alkoxysiloxanes as low VOC coupling agents (D3, example 1 and col.4, l.15-31).

The present application differs from D3 in that mixtures of vinyl- or acrylic functional alkoxysiloxanes with alkyl- or phenyl alkoxysiloxanes are disclosed.

Therefore the subject-matter of claims 1-17 is novel over D3.

D6 discloses physical mixtures of monomeric unsaturated alkoxy silanes with oligomeric alkylalkoxy siloxanes (cf. D6, table 2, examples 6-10).

The present application differs from D6 in that it discloses mixtures which contain oligomeric unsaturated siloxanes.

Therefore the subject-matter of claims 1-17 is novel over D6.

2. The subject-matter of claims 1-17 is inventive in the sense of Art.33(3) PCT.

D6 relates to mixtures of ethylenically unsaturated **silanes** with organosiloxane oligomers used as coupling compositions to improve adhesion between filler and elastomer and is therefore regarded as closest prior art.

Starting from D6 the objective technical problem to be solved is the provision of coupling compositions with reduced amount of volatile organic compounds (VOC) and reduced costs.

The problem is solved in that a mixture of vinyl- or acrylic functional and non-functional alkoxy **siloxane oligomers** is used.

It is shown in the examples of the present application (cf. table 2.2.) that the amount of VOC of the elastomers is reduced.

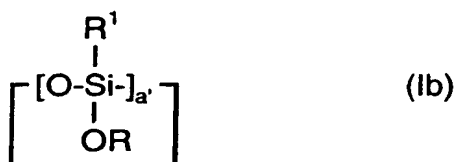
Although vinylmethoxy siloxanes, e.g. DS6498 are known from D4, example 2 and alkylalkoxy siloxanes are disclosed in D5, the use of a mixture of these two species is not disclosed in the prior art.

Therefore, the presence of an inventive step is acknowledged for the subject-matter of claims 1-17 vis-à-vis the document D6.

3. The subject-matter of claims 1 to 17 is industrial applicable in the sense of Art.33(4) PCT.

**What is claimed is:**

1. A composition acting as coupling agent between fillers and peroxidically crosslinking elastomers in rubber compounds, which comprises, as component comprising silicon compounds, a mixture
  - a) of vinylalkoxysiloxanes with alkylalkoxysiloxanes, or
  - b) of vinylalkoxysiloxanes with phenylalkoxysiloxanes, or
  - c) of vinylalkoxysiloxanes with phenyl/alkylalkoxysiloxanes or
  - d) of acrylic or methacrylic alkoxy-siloxanes with alkylalkoxysiloxanes, or
  - e) of acrylic or methacrylic alkoxy-siloxanes with phenylalkoxysiloxanes, or
  - f) of acrylic or methacrylic alkoxy-siloxanes with phenyl/alkylalkoxysiloxanes.
2. The composition as claimed in claim 1, which comprises as other non-silicon-containing components, plasticizers and/or processing aids.
3. The composition as claimed in claim 1 or 2, which comprises from 0.1 to 100% by weight of a vinyl-, acrylic-, or methacrylic-functional alkoxy-siloxane, based on all of the components present in the composition.
4. The composition as claimed in any of claims 1 to 3, which comprises from 0 to 80% by weight of the alkyl- or phenyl-functional alkoxy-siloxane, based on all of the components present in the composition.
5. The composition as claimed in any of claims 1 to 4, which comprises at least one vinylalkoxysiloxane of the general formula (Ia) or (Ib)



where the groups R are identical or different and R is methyl, ethyl, n-propyl, isopropyl, 2-methoxyethyl, or hydrogen, R<sup>1</sup> is a vinyl group, each of a and a', independently, is an integer from 2 to 50, where the siloxanes may be present in the form of linear, branched, or cyclic moieties.

6. The composition as claimed in any of claims 1 to 5, which comprises

at least one alkylalkoxysiloxane of the general formula (IIa) or (IIb)



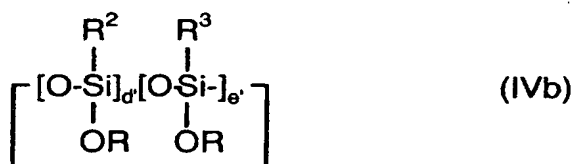
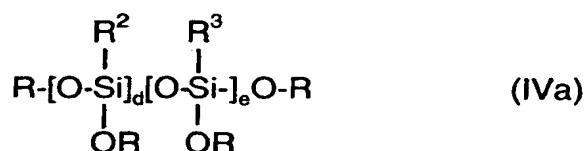
where the groups R are identical or different and R is methyl, ethyl, n-propyl, isopropyl, 2-methoxyethyl, or hydrogen, the groups R<sup>2</sup> are identical or different, and each R<sup>2</sup> is a linear, branched, or cyclic alkyl group having from 1 to 18 carbon atoms, each of b and b', independently, is an integer from 2 to 50, where the siloxanes may be present in the form of linear, branched, or cyclic moieties.

7. The composition as claimed in any of claims 1 to 6,  
which comprises  
at least one phenylalkoxysiloxane of the general formula (IIIa) or (IIIb)



where the groups R are identical or different and R is methyl, ethyl, n-propyl, isopropyl, 2-methoxyethyl, or hydrogen,  $\text{R}^3$  is a phenyl group, each of c and  $c'$ , independently, is an integer from 2 to 50, where the siloxanes may be present in the form of linear, branched, or cyclic moieties.

8. The composition as claimed in any of claims 1 to 7,  
which comprises  
at least one alkylphenylalkoxysiloxane of the general formula (IVa) or (IVb)



where the groups R are identical or different and R is methyl, ethyl, n-propyl, isopropyl, 2-methoxyethyl, or hydrogen, the  $\text{R}^2$  groups are identical or different, each  $\text{R}^2$  being a linear, branched, or cyclic alkyl group having



from 1 to 18 carbon atoms,  $R^3$  is a phenyl group, each of d, d', e and e', independently, is an integer from 1 to 35 and complies with the provisos that  $1 < (d+e) < 50$  and  $1 < (d'+e') < 50$ , where the siloxanes may be present in the form of linear, branched, or cyclic moieties.

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9. The composition as claimed in any of claims 1 to 8, which comprises at least one acrylic or methacrylic alkoxy siloxane of the general formula (Va) or (Vb)

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where the groups R are identical or different and R is methyl, ethyl, n-propyl, isopropyl, 2-methoxyethyl, or hydrogen, the groups  $R^4$  are identical or different, and  $R^4$  is an acrylic or methacrylic group, each of f and f', independently, is an integer from 2 to 50, where the siloxanes may be present in the form of linear, branched, or cyclic moieties.

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10. The composition as claimed in any of claims 1 to 9, which has been applied to a carrier.
11. The composition as claimed in claim 10, wherein the carrier material has been selected from the series porous polymer, carbon black, wax, silica, and calcium silicate.

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12. The use of the composition as claimed in any of claims 1 to 11 as coupling agent in filled and peroxidically crosslinking rubber compounds.
13. A filled and peroxidically crosslinking rubber compound which comprises a composition as claimed in any of claims 1 to 11.
14. The rubber compound as claimed in claim 13, which comprises a content of elastomer from the series ethylene-propylene rubber (EPR), ethylene-propylene-diene rubber (EPDM), styrene-butadiene rubber (SBR), natural rubber (NR), acrylate copolymer rubber (ACM), acrylonitrile-butadiene rubber (NBR), polybutadiene rubber (BR).
15. The rubber compound as claimed in claim 13 or 14, which comprises a content of filler from the series silicatic or organic fillers.
16. The rubber compound as claimed in claim 15, which comprises a content of filler from the series kaolin, silica, quartz, cristobalite, talc, montmorillonite, wollastonite, mica, calcium carbonate, chalk, dolomite, aluminum hydroxide, magnesium hydroxide, titanium dioxide, cellulose, flax, and sisal.
17. An item obtained during the processing of rubber compounds as claimed in any of claims 12 to 16.

## PATENT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

DEGUSSA AG  
Intellectual Property Management  
Patente U. Marken, Bau 1042/PB 15  
45764 Marl  
Germany

Date of mailing (day/month/year) 29 July 2003 (29.07.03)	<b>IMPORTANT NOTIFICATION</b>
Applicant's or agent's file reference O.Z. 6069-WO	
International application No. PCT/EP03/06543	International filing date (day/month/year) 20 June 2003 (20.06.03)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 22 August 2002 (22.08.02)
Applicant DEGUSSA AG et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
22 Augu 2002 (22.08.02)	102 38 369.3	DE	22 July 2003 (22.07.03)

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 338.89.70

Authorized officer

M-Chr. GUILLEMOT (Fax 338 8970)

Telephone No. (41-22) 338 9838

From the INTERNATIONAL BUREAU

**PCT**NOTICE INFORMING THE APPLICANT OF THE  
COMMUNICATION OF THE INTERNATIONAL  
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

DEGUSSA AG  
Intellectual Property Management  
Patente U. Marken, Bau 1042/PB 15  
45764 Marl  
ALLEMAGNEDate of mailing (day/month/year)  
04 March 2004 (04.03.2004)Applicant's or agent's file reference  
O.Z. 6069-WO**IMPORTANT NOTICE**International application No.  
PCT/EP2003/006543International filing date (day/month/year)  
20 June 2003 (20.06.2003)Priority date (day/month/year)  
22 August 2002 (22.08.2002)

Applicant

DEGUSSA AG et al

1. Notice is hereby given that the International Bureau has **communicated**, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this notice:

AU, AZ, BY, CH, CN, CO, DZ, EP, HU, JP, KG, KP, KR, MD, MK, MZ, RU, TM, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE, AG, AL, AM, AT, BA, BB, BG, BR, BZ, CA, CR, CU, CZ, DE, DK, DM, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, ID, IL, IN, IS, KE, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MG, MN, MW, MX, NI, NO, NZ, OM, PH, PL, PT, RO, SC, SD, SE, SG, SK, SL, TJ, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this notice is a copy of the international application as published by the International Bureau on 04 March 2004 (04.03.2004) under No. WO 2004/018546

4. **TIME LIMITS for filing a demand for international preliminary examination and for entry into the national phase**

The applicable time limit for entering the national phase will, **subject to what is said in the following paragraph**, be **30 MONTHS** from the priority date, not only in respect of any elected Office if a demand for international preliminary examination is filed before the expiration of **19 months** from the priority date, but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see *PCT Gazette* No. 44/2001 of 1 November 2001, pages 19926, 19932 and 19934, as well as the *PCT Newsletter*, October and November 2001 and February 2002 issues.

In practice, **time limits other than the 30-month time limit** will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For **regular updates on the applicable time limits** (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at <http://www.wipo.int/pct/en/index.html>.

For filing a **demand for international preliminary examination**, see the *PCT Applicant's Guide*, Volume I/A, Chapter IX. Only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

It is the applicant's **sole responsibility** to monitor all these time limits.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Gijsbertus Beijer - Carlos Roy

Facsimile No.(41-22) 740.14.35

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